

1969

**OPERATING
SUMMARY**

FORT WILLIAM

water pollution control plant

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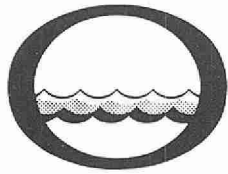
Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission


135 St. Clair Ave. W.
Toronto 195
Ontario

The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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FORT WILLIAM
water pollution control plant

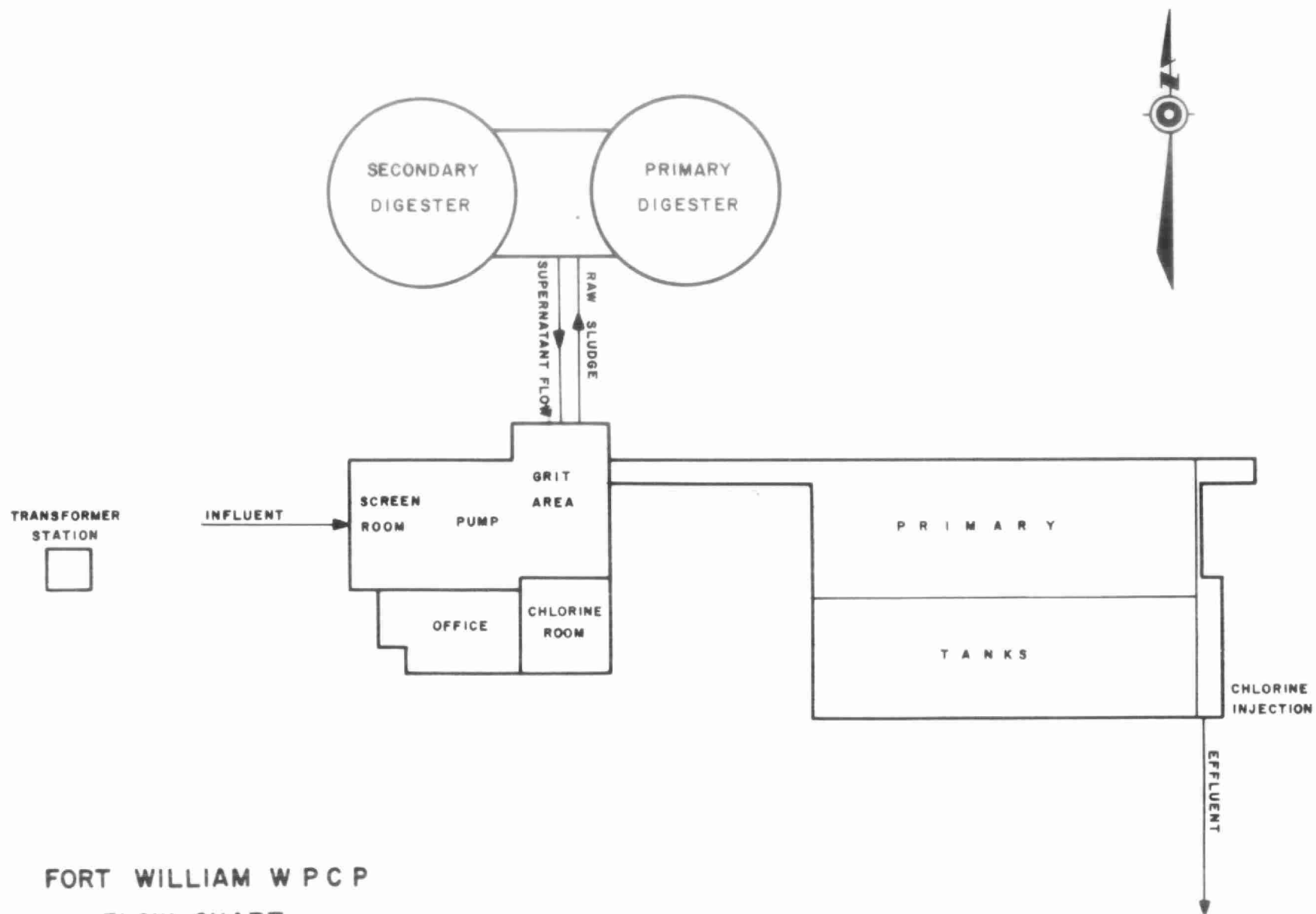
operated for

THE CITY OF FORT WILLIAM

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY



DESIGN DATA

PROJECT No.	2-0091-61	TREATMENT	Primary
DESIGN FLOW	6.0 mgd	DESIGN POPULATION	48,000

PRIMARY TREATMENT

Screening

- Trash Racks
Type: Jeffrey
Size: Two with 3" spacing
- Grinder
Type: Jeffrey (One)
- Coarse bar screens
Type: David Brown
Size: Two with 1" spacing

Sewage Lift Pumps

Type: Fairbanks-Morse
Size: Two 5140 gpm @ $36\frac{1}{2}$ ' tdh
Two 3490 gpm @ $36\frac{1}{2}$ ' tdh
(variable speed, electric)

Grit Removal

Type: Aerated; grit removed by clamshell bucket
Size: One 29' x 25' x 15' deep
Retention: 1.5 min

Primary Sedimentation

Type: Jeffrey
Size: Two 132' x 37' x 10' avg
(622,000 gal)

Retention: 2.5 hours
Loading: Surface, 600 gal/ft²/day
Weir, 10,000 gal/ft/day

CHLORINATION

W & T

Chlorine Contact Chamber

- in effluent chamber

OUTFALL

- to Kam River

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --
Type - Gas mixed PFT
Size - One 60' dia (71,000 cu ft or 442,000 gal)
Loading - 3.0 lb/ft³/mo

Secondary --
Size - One 60' dia (71,000 cu ft or 442,000 gal)
Total Loading - 1.5 lb/ft³/mo

'69 REVIEW

GENERAL

The plant operated well during the year with few problems. The total flow to the plant was about 294 million gallons less than the 1968 flows. As a result, the cost per million gallons treated was slightly higher at \$46.60, compared with \$37.96 in 1968.

The plant, operated by a chief operator, six permanent employees and one casual operator, is supervised 16 hours a day, seven days a week.

The Brunswick sewage pumping station is also operated by plant personnel as are the special chambers on the Kam Interceptor sewer.

EXPENDITURES

Total operating expenditures during the year amounted to \$83,853.21. The plant treated 1799.7 mil. gal. of sewage. Therefore, the cost per million gallons of sewage treated was \$46.60 -- higher than in 1968 because of lower flows. The cost per pound of BOD removed was 8 cents.

PLANT FLOWS and CHLORINATION

A total of 1799.7 mil. gal. of sewage was treated during the year. The average daily flow was 4.9 mil. gal., and the maximum and minimum daily flows were 11.9 mil. gal. and 3.2 mil. gal. respectively.

The plant effluent was chlorinated from May 25 to October 31. A total of 29,249 pounds was used at an average dosage of 3.1 milligrams per litre.

PLANT EFFICIENCY

The influent BOD and suspended solids averaged 147 and 127 mg/l respectively. The effluent BOD and suspended solids averaged 86 and 62 mg/l, resulting in a 41% reduction in BOD and a 51% reduction in suspended solids.

SLUDGE DIGESTION

A total of 573,400 gallons of raw sludge was digested. Solids totalled 3.6% in the raw sludge and 15.5% in the digested sludge.

During the year 2214 cu. yds. of liquid digested sludge was hauled to a disposal site.

CONCLUSIONS

With the 1969 precipitation being approximately half that of 1968, a larger portion of the domestic and industrial waste flows reached the plant instead of overflowing to the storm sewers. As a result, the reduced flow to the plant was more concentrated and a greater amount of BOD was removed.

During the spring and summer months, the plant operated at or near its hydraulic design capacity. For the rest of the year, the plant operated below this capacity.

Amalgamation of the Cities of Fort William and Port Arthur into the City of Thunder Bay will influence the future size of the plant.

PROJECT COSTS

2-0091-61 (Water Pollution Control Plant)

NET CAPITAL COST (Final)	\$2,589,550.83
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>1,722,029.58</u>
Long Term Debt to OWRC	\$ <u>867,521.25</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	\$ <u>100,199.76</u>
Net Operating	\$ 83,863.21
Debt Retirement	17,507.00
Reserve	13,639.16
Interest Charged	<u>48,568.05</u>
TOTAL	\$ <u>163,577.42</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 50,610.94
Deposited by Municipality	13,639.16
Interest Earned	<u>3,093.79</u>
	\$ 67,343.89
Less Expenditures	<u>3,000.00</u>
Balance @ December 31, 1969	\$ <u>64,343.89</u>

2-0050-60 (Interceptor Sewer)

NET CAPITAL COST (Final)	\$1,336,345.25
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>885,626.69</u>
Long Term Debt to OWRC	\$ <u>480,718.56</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	\$ <u>81,167.49</u>
Net Operating	\$ 247.84
Debt Retirement	9,701.00
Reserve	6,733.11
Interest Charged	<u>26,912.96</u>
TOTAL	\$ <u>43,594.91</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 63,708.21
Deposited by Municipality	6,733.11
Interest Earned	<u>3,771.75</u>
	\$ 74,213.07
Less Expenditures	<u>-</u>
Balance @ December 31, 1969	\$ <u>74,213.07</u>

2-0175-64 (Kam Interceptor Sewer)

NET CAPITAL COST (Est.)	\$835,832.42
DEDUCT - Portion financed by CMHC/MDLB (Est.)	<u>581,864.23</u>
Long Term Debt to OWRC	<u>\$253,968.19</u>
 Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	 \$ <u>16,337.29</u>
 Net Operating	\$ 632.65
Debt Retirement	5,125.00
Reserve	3,882.10
Interest Charged	<u>14,175.44</u>
 TOTAL	 \$ <u>23,815.19</u>

RESERVE ACCOUNT

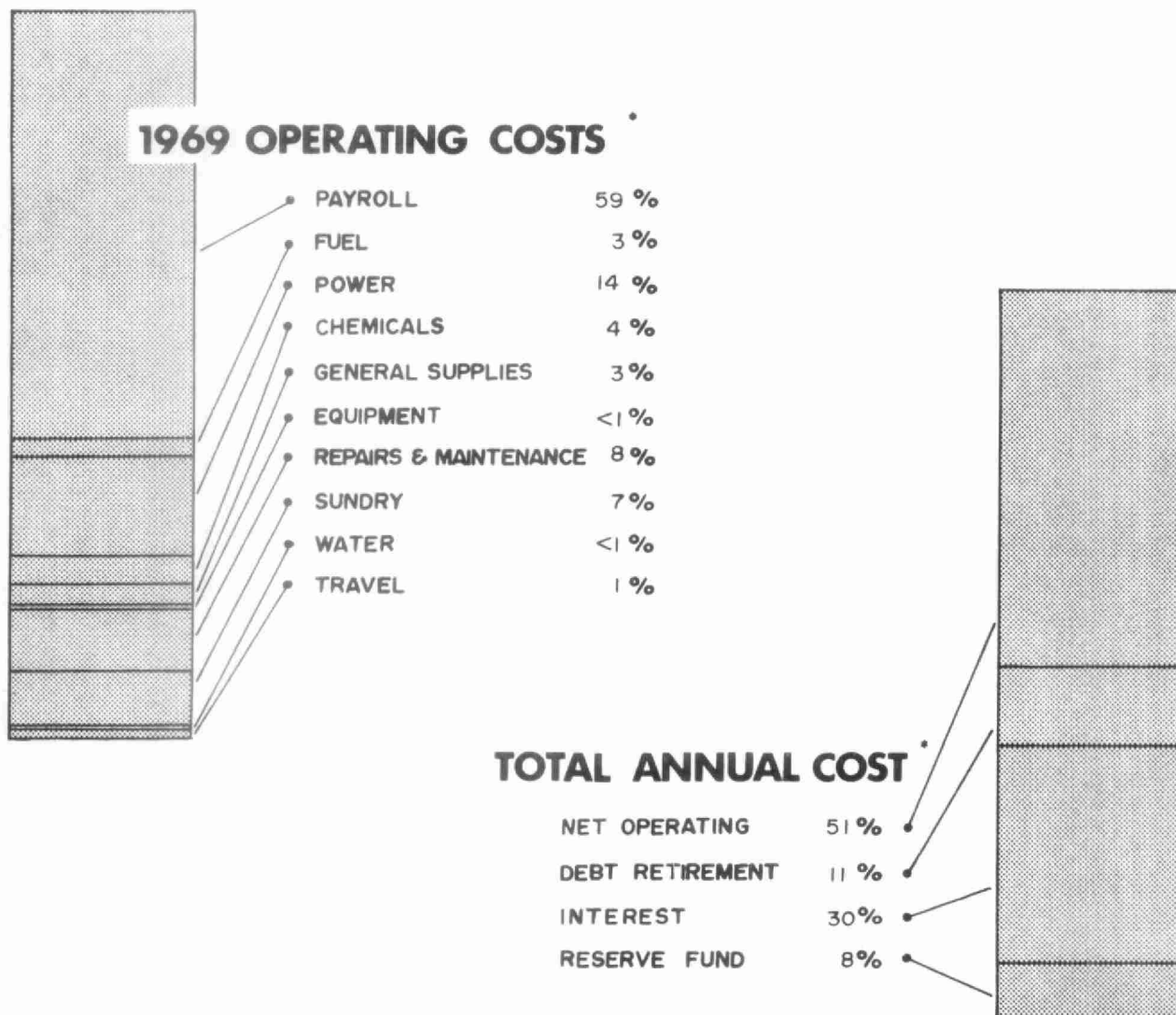
Balance @ January 1, 1969	\$ 7,570.90
Deposited by Municipality	3,882.10
Interest Earned	<u>517.69</u>
	\$ 11,970.69
 Less Expenditures	 <u>-</u>
Balance @ December 31, 1969	\$ <u>11,970.69</u>

2-0173-64 (Brunswick Ave. Sewage Pumping Station)

NET CAPITAL COST (Final)	
Long Term Debt to OWRC	\$28,502.68
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	\$ 2,863.32
Net Operating	\$ -
Debt Retirement	575.00
Reserve	158.60
Interest Charged	<u>1,595.71</u>
TOTAL	\$ <u>2,329.31</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 685.07
Deposited by Municipality	158.60
Interest Earned	<u>42.57</u>
	\$ 886.24
Less Expenditures	<u>-</u>
Balance @ December 31, 1969	\$ <u>886.24</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	676.38	\$53,523.57	\$79.13	23 cents
1966	995.52	53,980.73	54.22	16 cents
1967	1441.77	65,894.52	45.70	14 cents
1968	2093.0	79,442.39	37.96	11 cents
1969	1799.7	83,863.21	46.60	8 cents

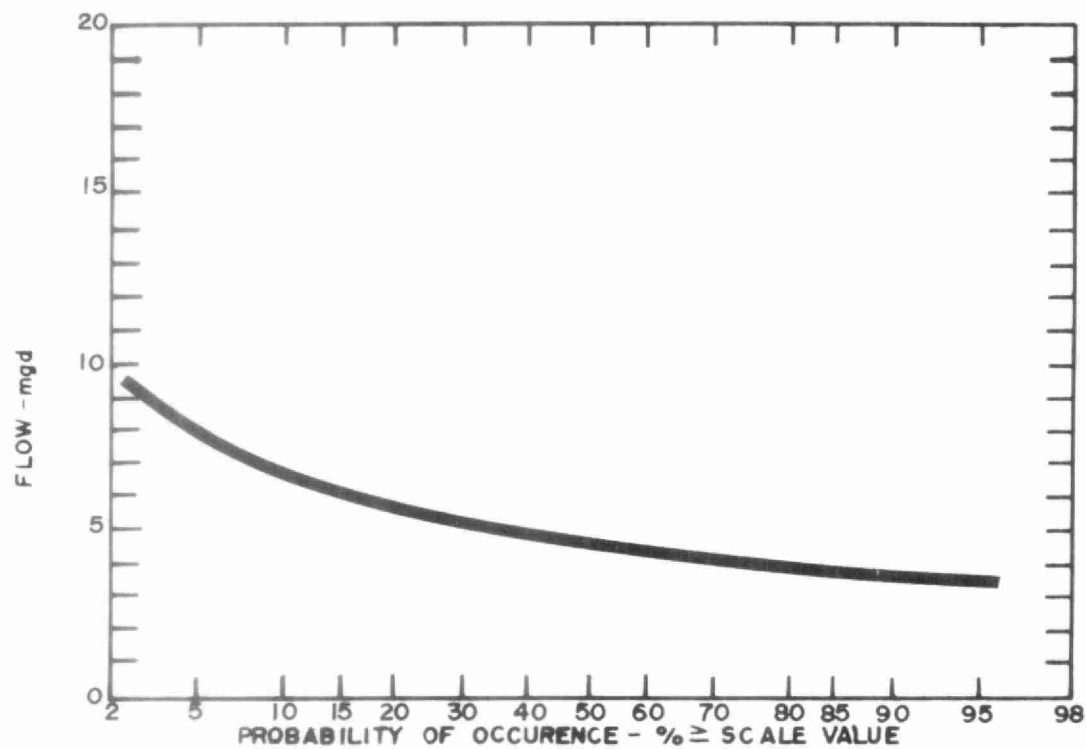
• 2-0091-61 ONLY

Monthly Operating Costs

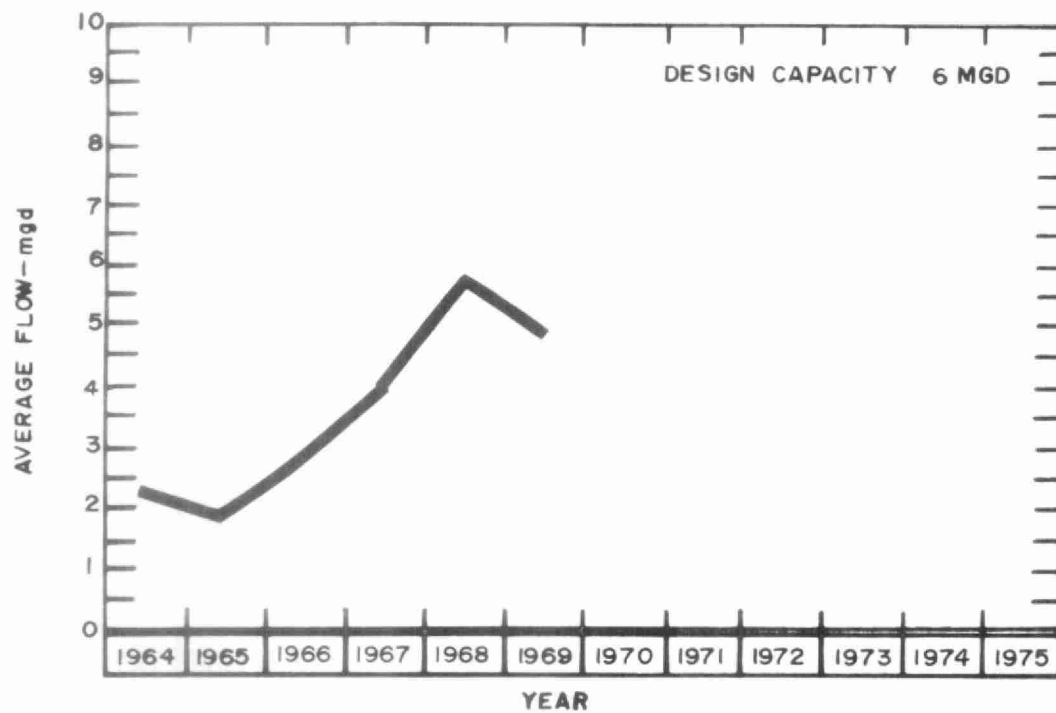
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	7545.55	5147.13	634.15	302.77	942.19	-	61.34	-	384.26	-	73.71	-
FEB	5410.76	3275.50	370.64	350.33	913.56	-	141.70	-	336.88	22.15	-	-
MAR	5873.59	3298.84	370.64	356.67	837.64	-	158.84	-	319.38	531.58	-	-
APR	6880.23	3328.04	375.68	206.18	934.27	-	246.88	-	1217.26	571.92	-	-
MAY	7455.22	3613.80	280.27	177.32	1145.56	1425.90	238.03	-	151.60	182.33	76.41	164.00
JUNE	5281.29	4523.49	-	159.04	12.78	-	162.08	-	278.43	135.47	-	10.00
JULY	6895.29	3663.98	-	125.56	2151.88	-	141.12	-	150.72	493.69	-	168.34
AUG	8984.86	5010.65	601.78	-	1079.73	1833.30	267.64	-	84.28	32.33	75.15	-
SEPT	6434.41	3825.77	23.82	210.36	1056.93	-	79.76	302.56	334.35	518.86	-	82.00
OCT	5338.56	3845.96	-	246.66	973.17	-	106.52	16.17	57.10	36.66	56.32	-
NOV	5872.73	3779.50	-	96.00	967.39	-	247.52	98.86	153.38	295.52	-	224.56
DEC	11890.72	3859.03	-	254.26	858.99	-	423.77	-	3020.42	3221.06	66.29	186.90
TOTAL	83863.21	47171.69	2656.98	2485.15	11874.09	3259.20	2275.20	417.59	6498.06	6041.57	347.88	835.80

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$2290.30

PROCESS DATA



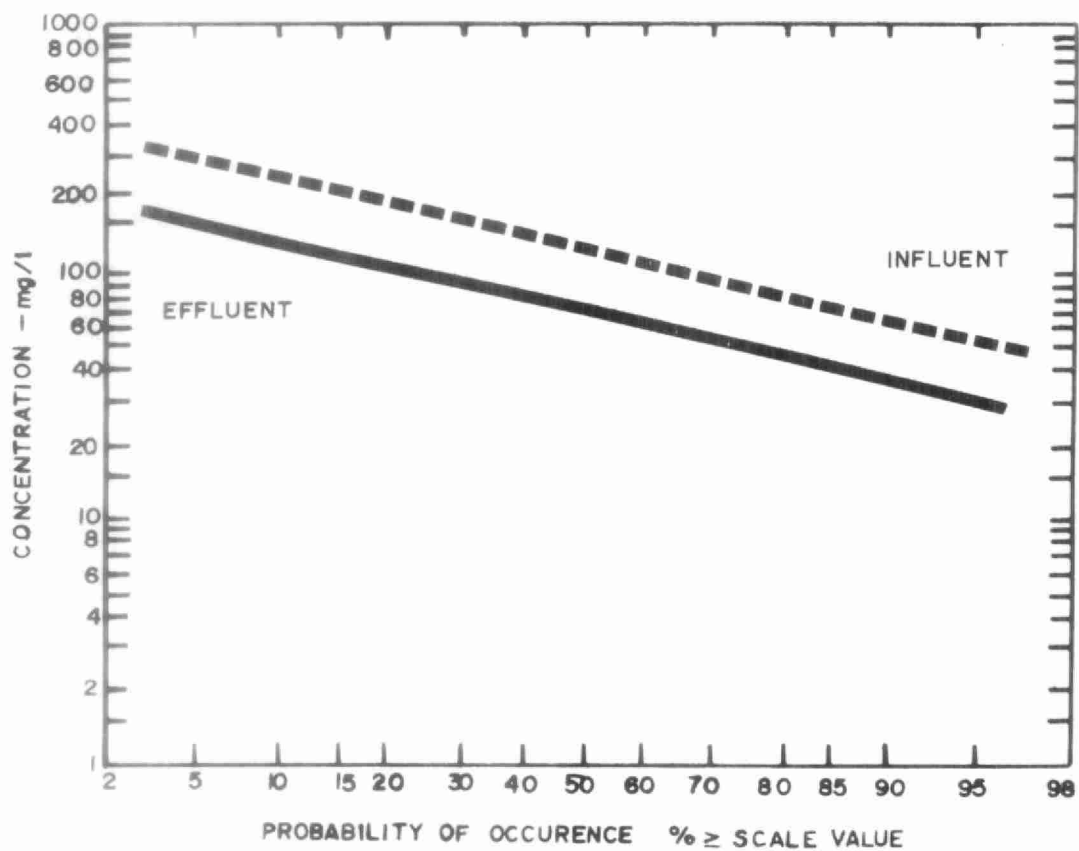
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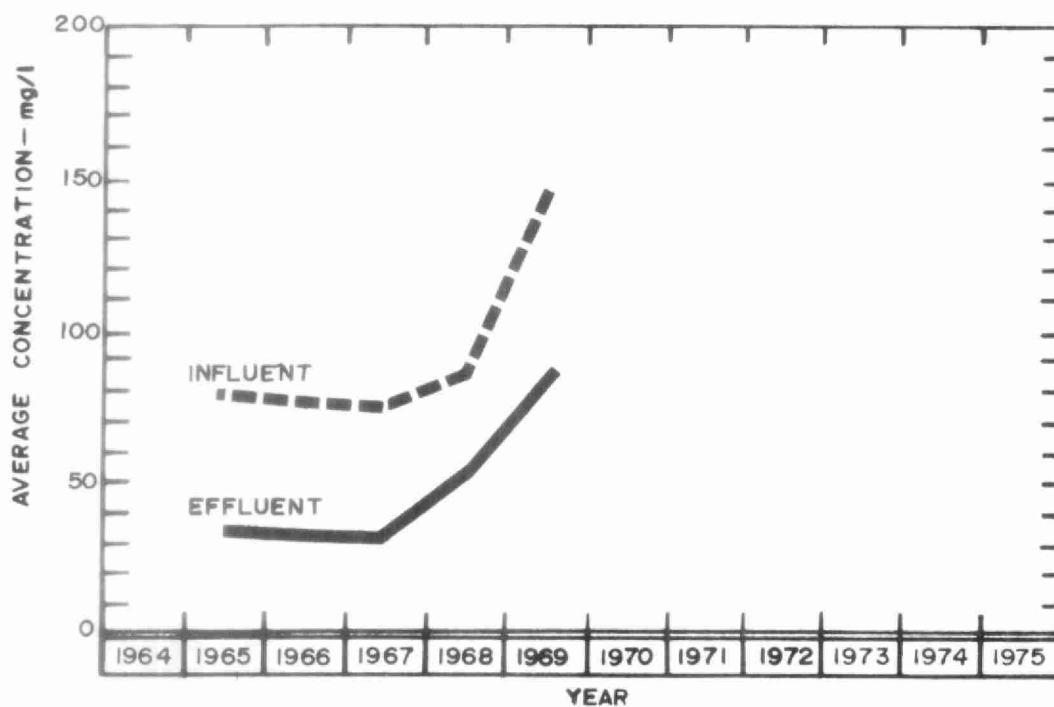
PLANT FLOWS and CHLORINATION

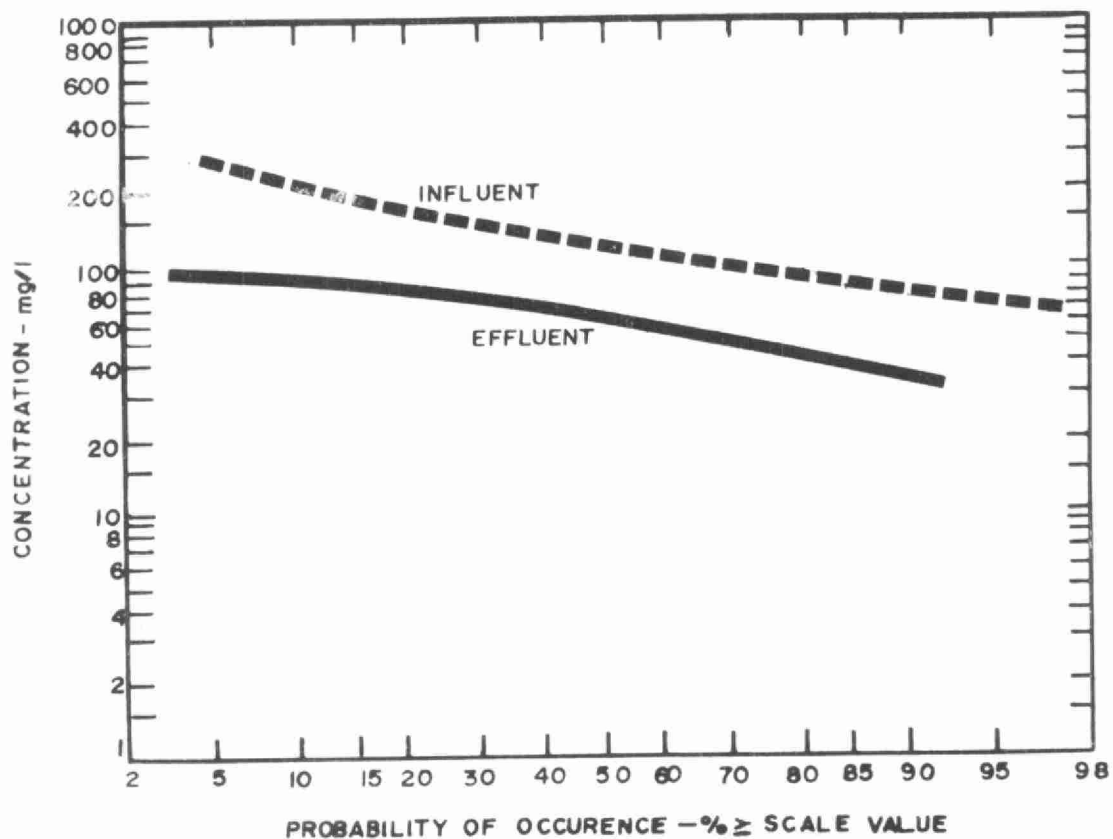
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	110.0	3.5	3.9	3.2	0	0
FEB	101.8	3.6	4.0	3.2	0	0
MAR	139.2	4.5	7.4	3.4	0	0
APR	252.1	8.4	11.9	5.4	0	0
MAY	192.8	6.2	9.5	5.2	3.54*	1.8
JUNE	162.3	5.4	8.2	4.2	5.63	3.4
JULY	157.4	5.1	6.4	4.3	5.32	3.4
AUG	169.3	5.5	8.4	4.3	4.23	2.5
SEPT	145.2	4.8	7.0	3.9	4.99	3.4
OCT	137.4	4.4	7.3	3.8	5.53*	4.0
NOV	118.8	4.0	5.1	3.5	0	0
DEC	113.4	3.7	3.9	3.2	0	0
TOTAL	1799.7	-	-	-	29.24	-
AVERAGE	-	4.9	-	-	-	3.1

* Chlorination from May 15 to October 31

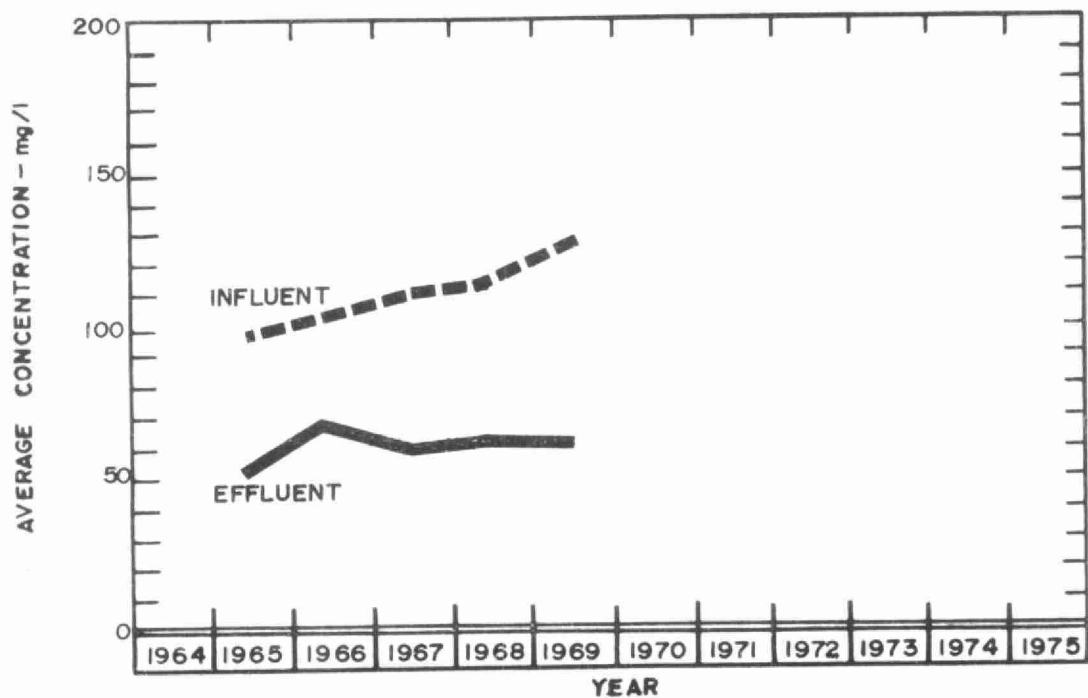


BIOCHEMICAL OXYGEN DEMAND



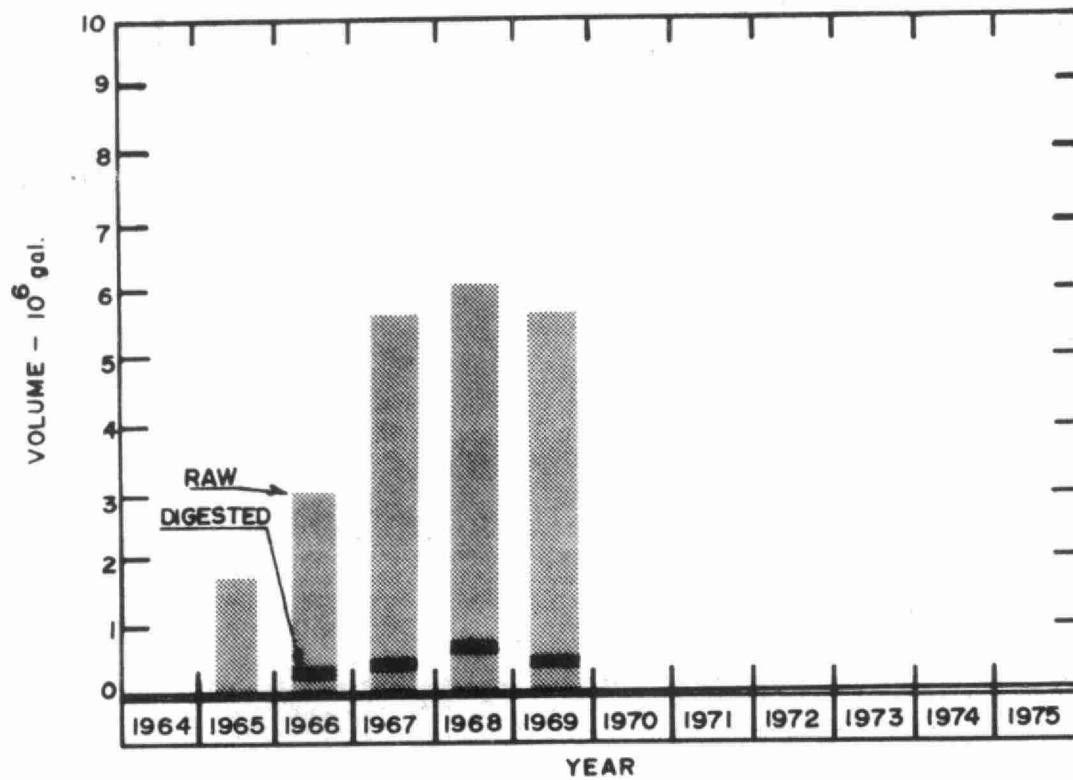


SUSPENDED SOLIDS

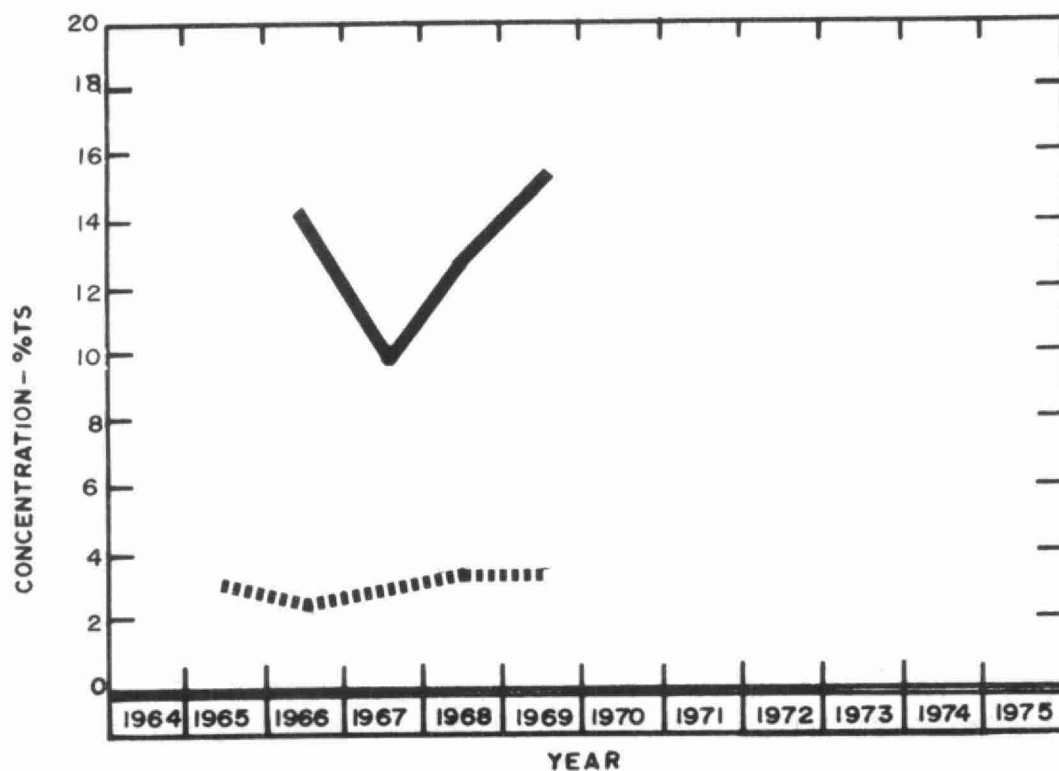


PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ³ pounds			%	10 ³ pounds	cu ft
JAN	143	98	31	50.	130	64	51	73.	98
FEB	118	76	36	43.	107	58	46	50.	105
MAR	140	95	32	62.	138	71	48	93.	203
APR	128	70	45	146.	109	73	33	91.	280
MAY	146	94	36	100.	122	66	46	108.	154
JUNE	139	84	40	89.	146	65	55	131.	196
JULY	128	83	35	71.	129	64	50	102.	357
AUG	87	57	34	51.	87	53	39	58.	420
SEPT	183	116	36	97.	117	56	52	89.	231
OCT	142	63	56	109.	103	43	58	82.	168
NOV	174	89	49	101.	190	75	61	137.	91
DEC	241	111	54	147.	147	58	61	101.	133
TOTAL	-	-	-	-	-	-	-	-	2436
AVERAGE	147	86	41	89.	127	62	51	93.	203



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 gal	%	cu yd	cu yd
JAN	455.	-	-	12.	-	-	-	-	0	71
FEB	377.	-	-	67.	-	-	-	-	0	400
MAR	512.	-	-	72.	-	-	-	-	0	426
APR	594.	-	-	0	-	-	-	-	0	0
MAY	468.	-	-	30.	-	-	-	-	0	181
JUNE	496.	5.8	-	64.	13.0	-	-	-	0	380
JULY	478.	-	-	136.	-	-	-	-	0	814
AUG	471.	1.9	28	0	17.1	3.0	-	-	0	0
SEPT	485.	3.0	71	0	16.4	29	-	-	0	0
OCT	446.	-	-	74.	-	-	-	-	0	442
NOV	452.	-	-	0	-	-	-	-	0	0
DEC	500.	-	-	0	-	-	-	-	0	0
TOTAL	5734.	-	-	455.	-	-	-	-	0	2214
AVERAGE	478.	3.6	49	65.	15.5	30	-	-	0	226



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